PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P045320PCT RJO/do	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/NL 03/00461	International filing date *(day/month/year)* 23.06.2003	Priority date *(day/month/year)* 28.06.2002
International Patent Classification (IPC) or both national classification and IPC B01D65/06		
Applicant NEDERLANDSE ORGANISATIE VOOR TOEGEPAST... et al.		

1. This International preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22.01.2004	11.11.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Marti, P Telephone No. +49 89 2399-7858

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL 03/00461

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-8 as originally filed

Claims, Numbers

1-10 received on 21.07.2004 with letter of 21.07.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Present claim 1 is directed to a process for cleaning a membrane filter containing residues from filtering beverages, especially water-insoluble proteins and/or polyphenols, wherein the filter is back-flushed with a solution containing an oxidising agent selected from a peroxide compound and a hypohalous acid in presence of a transition. The process does not require the use of 2,2,6,6-tetramethylpiperidine-N-oxyl (TEMPO), and it is not required that after the oxidative cleaning the membranes be treated with a reducing agent.

2.1 The following documents are referred to in this communication:

D1: WO 97 45523 A
D2: DE 195 03 060 A
D3: EP-A-0 733 594
D4: JP 04 267933 A

2.2 Document D1 discloses a process of cleaning a filter for filtering beverages (see page 4, line 36-page 5, line 4) comprising the step of contacting the filter with a solution containing an oxidising agent (= an hypohalous acid such as HOCl or HOBr, see page 5, lines 14-24) and TEMPO. D1 mentions in its introductory part that conventional cleaning techniques comprise the use of a complex of peroxide and a metal such as manganese, but, at the same time, D1 clearly states that these agents are not satisfactory, since the flux cannot be restored to the original value.

Document D2 discloses a process of cleaning a membrane filter used for filtering beer comprising the step of contacting the filter with a solution containing an oxidising agent (= hydrogen peroxide). However, D2 does not disclose that the oxidising agent should be used in presence of a transition metal.

Document D3 discloses the use of peroxided together with transition metal complexes for removing persistent compounds in liquids and solids (such as vegetable waste and fruit waste) is already known from D3. A transition metal, such as iron or manganese (see col. 1, l. 49-52) is complexed with a polyamine (see col. 1, l. 54-21), wherein the treatment with the transition metal complex is

carried out in the presence of a peroxide such as hydrogen peroxide or a peracid (see col. 2, l. 26-51). However, D3 does not mention the use of the complexes for removing water-insoluble proteins and/or polyphenols and, moreover, it does not disclose that the process should be performed by back-flushing.

Document D4 discloses a method for cleaning a filter comprising the step of contacting the filter with an oxidation agent (an enzyme), wherein the contacting is performed as a back-flush.

2.3 Document D2 can be regarded as the closest prior art. The process of claim 1 differs from the process disclosed in D2 in that a transition metal is used together with the oxidising agent and in that the process is carried out by back-flushing. The applicant has found that the cleaning is particularly effective when it is carried by back-flushing.
Even if the skilled person starting from D2 would have considered the teaching of D3, he would not have any incentive to perform the cleaning process with these agents by back-flushing.

2.4 None of the remaining documents provides any suggestion or indication to modify the teaching of D2 in order to arrive at the claimed subject-matter which can be considered therefore as novel and inventive (Art. 33.2 and 33.3 PCT).

Certain observations on the international application

1. Claim 1 should specify that the term "TEMPO" corresponds to 2,2,6,6-tetramethylpiperidine-N-oxyl (Art. 6 PCT).

2. The description contains embodiments of the invention which do not fall within the scope of the claims. This inconsistency between the claims and the description leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear (Art. 6 PCT).

3. The claims are not fully supported by the description (Art. 6 PCT). The insertion of a sentence in the description indicating that the invention is defined in the claims would suffice.

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Amended Claims

1. A TEMPO-free process of cleaning a membrane filter containing residues from filtering beverages, the residues containing water-insoluble proteins and/or polyphenols attached to the filter and polysaccharides, comprising contacting the protein and/or polyphenol containing residues with a solution containing an oxidising agent by back-flushing, said oxidising agent being selected from a peroxide compound and a hypohalous acid and being used in the presence of a transition metal.

2. A process according to claim 1, wherein the back-flush is performed at a rate of 0.5 - 100 l of the solution per h per m^2 of filter surface.

3. A process according to claim 1 or 2, wherein the transition metal is manganese or iron.

4. A process according to any one of claims 1-3, wherein the transition metal is complexed with a polyamine.

5. A process according to any one of claims 1-4, wherein the oxidising agent is hydrogen peroxide.

6. A process according to any one of claims 1-4, wherein the oxidising agent is a peracid.

7. A process according to any one of claims 1-4, wherein the oxidising agent is a hypohalous acid.